"DEVELOPMENT AND VALIDATION OF INSTRUCTIONAL INTERACTIVE COMPETENCIES (IIC) FOR TEACHING"

RESEARCH PROPOSAL TO BE SUBMITTED
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1. INTRODUCTION:

Education is an important instrument of human development. The quality of education largely depends upon the quality of teachers in general. It is the felt need to improve the quality of teacher education programme. The educationists wanted to reshape teacher education programmes. The method of approach for training in teaching adopted in training institutions needs scientific approach. Supervision of practice teaching is haphazard and mostly unreliable. There is no organized form of feedback regarding the performance of the teacher in the class room. The suggestions offered by the teacher educators are mostly subjective. They are based on general impressions. In this context, the alternative approach is adopted. This innovative method is *Microteaching*:

1.1 ORIGIN AND DEVELOPMENT OF MICRO-TEACHING:

Microteaching is one of the most important developments in the field of teaching practice. Microteaching is a constitute teacher training technique. It is a versatile tool that simplifies the teaching skills. Microteaching is a stimulated skill teaching to provide the feedback to teacher trainee for the modifications of teacher behaviour.

The idea of micro-teaching originated for the first time at Stanford University in USA, when an Experimental Project on the identification of teaching skills was in progress under the guidance and supervision of the faculty members (Bush, Allen, McDonald Acheson and many others). This project was aided by Ford Foundation and Kettering Foundation. The team of experts was assigned the development of testing and evaluation tools to measure the attainment of teaching skills. At this juncture Keath Acheson, a research worker was investigating the utility of video

tape recorder in the development of technical teaching skills. This instrument could be used for recording the class interaction and the behaviours of the trainee vividly and accurately.

This lead to the development of a systematic and accurate method of giving feedback to the teacher trainee. Thus, the term micro – teaching was first coined by A. W. Dwight Allen of the university in 1963.

1.2 MICRO-TEACHING IN INDIA:

Micro-Teaching was introduced in India in 1967, with the humble attempt made by D.D. Tiwari of Government Central Pedagogical Institute, Allahabad. In 1970, G.B. Shaw experimented with Micro-Teaching at M.S. University, Baroda. Then the Technical Teachers Training Institute, Madras introduced Micro-Teaching to train the technical teachers. TTTI of Kolkata started micro-teaching by audio-tape. In 1947, Dr. N.L. Dosajh used Micro-Teaching as a teaching device in Teachers Training Institute, Chandigarh. He also wrote a book namely: Modification of Teacher Behaviour through Micro-Teaching'. NCERT, SCERT, in the different states have been propagating this concept.

Identification of Teaching Skills:

There are many approaches for identifying teaching skills. The prominent among them are the following:

1. Observation of Class Room Interaction
2. Analysis of Teacher Tasks Through Interview and Discussion
3. Analysis of School Curriculum and Objectives
4. Conceptualization of a Good Teaching Model
5. Behaviour component cluster analysis.

The Australian Advisory Committee on Research and Development in Education has analysed teaching into 140 skills.

Allen of the Stand ford University (1969) has identified 14 teaching skills.

In India, B.K. Passi has given a list of 13 teaching skills. M.K. Jangira and Ajit Singh (1982) of NCERT provide a list of 20 teaching skills. Attempts have been made to list teaching skills.

B.K. Passi has given the following list of Teaching Skills in his book "Becoming Better Teacher; Micro-teaching Approach".

1. Writing instructional objectives 2. Introducing a lesson 3. Fluency in questioning 4. Probing questioning 5. Explaining 6. Illustrating with examples 7. Stimulus variation 8. Silence and non-verbal cues 9. Reinforcement 10. Increasing pupil participation 11. Using black board 12. Achieving Closure 13. Recognizing attending behaviour.

1.3 COMPETENCY-BASED EDUCATION AND TEACHING:

Defining competency is complex and an educational competency even more so. The Organization for Economic Cooperation and Development (OECD) through PISA (Program for International Student Assessment) has done much work on defining competencies. PISA states: 'A competency is more than just knowledge and skills. It involves the ability to meet complex demands, by drawing upon and mobilising [mobilizing] psychosocial resources (including skills and attitudes) in a particular context. For example, the ability to communicate effectively is a competency'… [PISA]

The most important characteristic of competency-based education is that it measures learning rather than time. Students progress by demonstrating their competence, which means they prove that they have mastered the knowledge and skills (called competencies) required for a particular course, regardless of how

long it takes. Attributes of Competency-based Teaching are as follows;

- Understand how learners learn
- Match principles of learning and teaching
- Facilitate, rather than control learning
- Model humility, critical thinking, respect, competency and caring at all times
- Support acquisition of knowledge, skills and professional behaviours in all learning domains (cognitive, psychomotor, affective)
- Promote and expect learner accountability for learning
- Provide timely, specific feedback on learner progress beginning with learner self-assessment
- Individualize learning experiences according to needs
- Expect increasing complexity of performance as the learner progresses throughout the program.

1.4 PEDAGOGICAL CONSIDERATIONS IN COMPETENCY-BASED EDUCATION:

Competency-based education can be pursued through various teaching approaches. However, all curricula need to be evidence-based and outcome focused and all teaching strategies need to be matched to their learning domain (psychomotor, cognitive and affective).Competence based learning places an emphasis on powerful or rich learning environments that enable students to engage in meaningful learning processes. The most distinctive features of this approach may be summarized as follows;

Meaningful contexts:

The teacher will create or to look for meaningful contexts in which students will in a natural way experience the relevance and the meaning of the competences to be acquired.

Multidisciplinary approach:

Competencies are holistic and as a consequence the educative approach needs to be integrative and holistic too.

Constructive learning:

The philosophy of competence based education has its roots in the social constructivism. By focusing on the construction of models, products, guidelines, rules of thumb, reports, or other tangible outputs the learning easily and naturally will turn out to be constructivist.

Cooperative, interactive learning (with peers, teachers)

The basic idea behind competence based education is to help learners to develop and construct their own knowledge and seek ways to make optimal use of other people's competence in their learning journey. This is what social constructivism is about. This requires an open approach in which education includes dialogues between learners and educators about expectation, needs, goals, choices etc.

Discovery learning

Discovery learning as opposed to receptive learning means making content available and accessible and that the way of acquiring this knowledge or competences, could not be just a process of providing information, but should always be embedded in a discovery based approach.

Reflective learning

Competence based learning also places an emphasis on the learning processes of the learner. As the learner reflects on their

own needs, motivation, approach, progress, results etc. they develop learning competences that may be considered “learning to learn”.

Personal learning

In the competence oriented theories learning is conceived as a process of constructing the learner’s own personal knowledge and competences. Information, knowledge, strategies, only become meaningful for a person if they become an integral part of their own personal body of knowledge and competences. In education this implies that students need to be able to identify with the contexts, the persons, the situations and interests that are included in the learning domains involved.

1.5 5E-INSTRUCTIONAL MODELS:

The principles of constructivism have been used to shape daily teaching practices in order to create more student-centered and effective learning environments. One of these practices based on constructivism is the 5E instructional model developed by Bybee (2006), the leading scientist in the Biological Sciences Curriculum Study (BSCS).

The 5E model is derived from the philosophical lineage of Johann Friedrich Herbart and John Dewey. The main idea behind constructivism is that individuals must be provided opportunities to construct their own knowledge and understanding (Herbart, 1901). Therefore, the learning environment needs to be designed as learner-centered, in which students are afforded opportunities to actively engage in the learning process (Dewey, 1971). In a learner-cantered environment with the 5E instructional model, teacher and student roles are no longer traditional.

Benefits of 5E Instructional Model:

The pre-service teachers found that the 5E instructional model differed from the traditional model with the 5E instructional model characterized as being more student-centered (Bozdogan & Altuncekic, 2007; Celik et al., 2018; Metin et al., 2011), creating deeper understanding (Althauser, 2018), and improving students creative thinking and critical thinking (Bozdogan & Altuncekic, 2007; Celik et al., 2018; Polgampala et al., 2016; Qablan & DeBaz, 2015).

During practicum experiences pre-service teachers and the students found the 5E instructional model to be a fun way to teach and learn. According to Althauser (2018), the 5E instructional model made math fun. Students were also more likely to retain knowledge gained from a fun environment (Bozdogan & Altuncekic, 2007; Celik et al., 2018; Duran et al., 2004; Metin et al., 2011; Polgampala et al., 2016).

The benefits of the 5E instructional model were emphasized only in international studies. The international researchers asked frequently about the benefits of the 5E instructional model during their interviews. Unfortunately, the pre-service teachers had a very limited and narrow perception of those benefits (Bozdogan & Altuncekic, 2007; Celik et al., 2018; Duran et al., 2004; Metin et al., 2011; Polgampala et al., 2016).

The 5E instructional model was originally developed in the United States and then adapted by international researchers who emphasized the benefits of the 5E instructional model. U.S. teacher educators need to more strongly convey to pre-service teachers that incorporating the 5E instructional model into their lesson design helps students build a stronger foundation of knowledge through active, creative participation.

As examples of support for using the 5E instructional model as an instructional strategy, Connecticut, Maryland, and Texas Education Agencies have strongly recommend the application of the 5E instructional model (Bybee et al., 2006)

1.6 NEED AND SIGNIFICANCE FOR THE STUDY:

The 5E instructional model was not only unfamiliar and difficult to implement for the pre-service teachers, but also implementing required effort and time. The challenges faced by the pre-service teachers in implementing the 5E instructional model are specifically applicable to each phase of the 5E model.

During the engagement phase of the 5E instructional model, pre-service teachers were challenged to find appropriate activities that would determine what students know or think about the topic (Demirbas & Pektas, 2015; Iscan et al., 2015; Metin & Ozmen, 2009; Namdar &Kucuk, 2018; Yildiz & KocakUsluel, 2016).

During the exploration/explanation phase, pre-service teachers found it challenging to shift instruction to a more learner-centred instructional model. Although the pre-service teachers planned a 5E instruction model, their classroom practice was not student-centered (Enugu & Hokayem, 2017; Namdar & Kucuk, 2018; Yildiz & Kocak Usluel, 2016). In addition, pre-service teachers are likely to not address students' misconceptions during this phase (Iscan et al., 2015).

During the elaboration phase, pre-service teachers struggled to find appropriate activities for this phase of the 5E instructional model (Enugu &Hokayem, 2017; Iscan et al., 2015; Metin & Ozmen, 2009; Namdar & Kucuk, 2018; Yildiz & KocakUsluel, 2016).

Pre-service teachers also struggled with evaluating students' understanding of the concepts (Enugu & Hokayem, 2017; Iscan et al., 2015; Namdar & Kucuk, 2018; Yildiz&KocakUsluel, 2016). Some of the preservice teachers did not have an assessment question that was tailored specifically to the content they taught (Enugu & Hokayem, 2017); some of the questions were not clear to the students (Enugu & Hokayem, 2017). The pre-service teachers often ran out of time during the evaluation phase, which led to asking students to finish their assessment at home (Iscan et al., 2015; Namdar & Kucuk, 2018).

Taking into consideration the viewpoints presented in the preceding pages and the development of microteaching work at the Centre of Advanced studies in Education, M.S. University of Baroda and Indoor University, Indoor it was highly desired to work on the follow up programmes for microteaching, which can provide a sound basis for transfer of skills from simulated training situation to real class rooms and to address training packages for constructivism that is 5E Model. The present study will be framed by the investigator with this purpose. The title of the study is framed as "Development and Validation of Instructional Interactive Competencies (IIC) for Teaching".

1.7 STATEMENT OF THE PROBLEM:

The Researcher will undertake the study **"Development and Validation of Instructional Interactive Competencies (IIC) for Teaching"**.

1.8 OBJECTIVES OF THE STUDY:

The following objectives are framed for the present study;

1. Identification of the basic Instructional Interactive Competencies (IIC) for 5E's lesson presentation
2. Development of training packages for the basic Instructional Interactive Competencies
3. Internal validation of basic Instructional Interactive Competencies
4. External validation of basic Instructional Interactive Competencies through experimental tryout
5. To study the impact of co-variables in relation to student teacher performance

1.9 HYPOTHESES OF THE STUDY:

The following research hypotheses are framed for the present study;

1. The basic IIC package is effective in terms of student teacher performance
2. The basic IIC package is effective in terms of 5E lesson presentation
3. The basic IIC package is better than traditional skill based practice
4. Impact of co-variables is more in relation to student teacher performance in basic IIC package

1.10 OPERATIONAL DEFINITION OF TERMS USED:

1) **Instructional Interactive Competencies (IIC):** IIC is a package developed by the researcher on all the five teaching competencies i.e. cognitive, performance, consequence, affective and exploratory competencies to enhance teaching competencies of secondary student teachers.

2) **Validation:** Validation is the process of ensuring that, the developed package satisfies the objectives pre decided for the package. In other words, it is the process to find out the extent of serving the purpose for which it has been developed**.**

1.11 VARIABLES OF THE STUDY:

The following variables were considered for the present study;

Nature of the Variable	Variable Considered
Independent Variable	IIC Packages
Dependent Variables	Student teacher performance
Co-variables	➢ Language ability, ➢ IQ, ➢ Content Mastery, ➢ General teaching competency, ➢ previous achievement, ➢ Institutional environment.

1.12 DELIMITATIONS OF THE STUDY:

In order to make the study concise, its scope pertaining to some of the aspects will be planned to limit to some extent. This study will be conducted with the B.Ed student teachers available in Department of Education, Karnataka State Akkamahadevi Women's University, Vijayapura, Karnataka State. Hence, the population from which the sample for the study will be entirely from DOE, KSAWU, Vijayapura.

2 REVIEW OF RELATED LITERATURE:

Following are the some of the related reviews considered on the basis of the variables in the present study. The reviews have been classified under four headings viz,

2.1. Reviews related to Microteaching:

Allen (1969) reports during first year at Stanford students trained with microteaching required 10 hours of instruction per week to reach a certain level of competence, whereas conventional practices needed 25 hours per week – to reach the same standard competence.

Bhattacharya (1975) conducted a study to find the feasibility of the use of audio tape a recording device for obtaining feedback. It was found that audio tape helps in producing indirectness skills and development of attitude towards microteaching.

Faintal, joshi, seth (Das et al. 1976) conducted studies in their respective institutions in order to determine the relative effectiveness of feedback provided by college supervisor and peer supervisor. They reported that there were no significant differences in the relative effectiveness of these two sources of feedback with regard to developing general teaching competence in student teachers.

2.2. Reviews related to CBT:

Hoogveld et al., (2005) conducted a study to determine the differential effects on the design of learning tasks for Competency-Based Teacher Education (CBTE) of a teacher training with a classical approach. The result shows that the classic condition performed significantly better than the alternative condition.

Al- Ajloni (2006) conducted a study that was aimed at constructing a training program for developing vocational competencies for trainers of vocational Training Corporation. The results revealed that the training program was high 4.62 out of 5, and it could be adopted according to the specialist's perspectives as a training program for vocational trainers in Jordan.

Al-Sayyed (2005) constructed a training program based on educational competencies for prevocational education teachers (PET) in the basic education cycle, and an assessment of its effectiveness in improving these competencies. The results of the three- way ANOVA and T-test analysis revealed that there were significant statistical differences in the degree of knowledge and performance competencies for PET in the basic education cycle due to the training program.

2.3. Reviews related to 5E:

Demirbas & Pektas, (2015); Iscan et al., (2015); Metin & Ozmen, (2009); Namdar & Kucuk, (2018); Yildiz & KocakUsluel, (2016) these studies reported thatDuring the engagement phase of the 5E instructional model, pre-service teachers were challenged to find appropriate activities that would determine what students know or think about the topic.

Althauser, (2018); Fletcher &Luft, (2011); Smolleck & Mongan, (2011) these three studies reported that teachers' beliefs about science/math, teaching science/math, and learning science/math directly influenced their classroom decisions and actions associated with teaching science/math. Supporting the pre-service teachers in shaping their views of teaching and learning will affect their beliefs and will ultimately change their practice.

Duran et al., (2004); Enugu & Hokayem, (2017) noted having more time to practice and plan the 5E lesson plan as possible solutions.

Duran et al., 2004; Enugu & Hokayem, 2017; Fletcher & Luft, 2011; Varma et al., 2009 these four studies reported that the pre-service teachers had a hard time applying theory to practice.

2.4. Reviews related to Validation of Instructional Material:

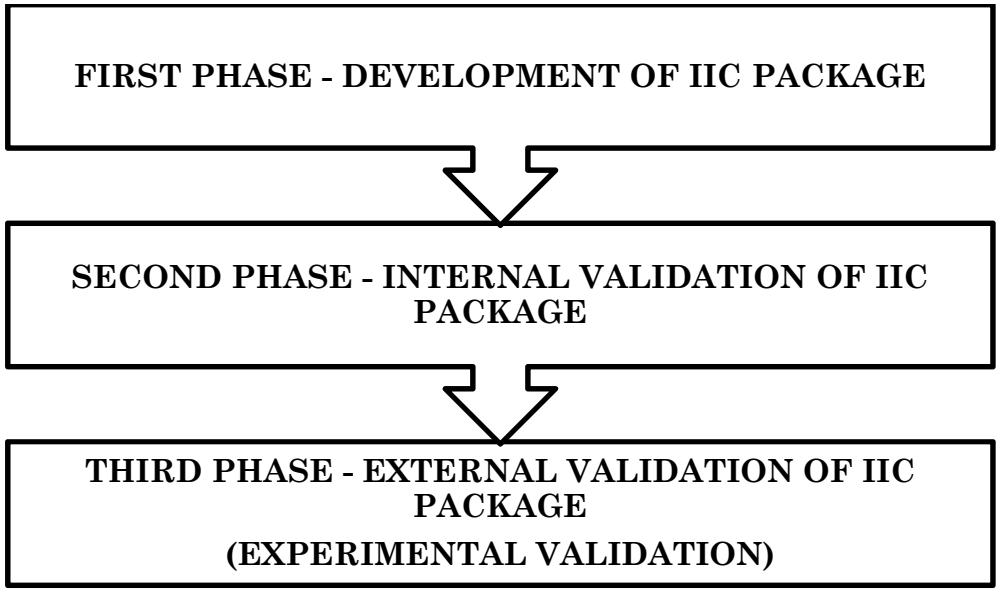
Passi, B.K. (1976) conducted a study to validate instructional material with the preparation of the first draft. Preliminary tryout and main field testing. These were the methodological steps adapted for the purpose. The experimental groups had an instructional material and skill based feedback for presenting the skills namely (i) introducing lesson (ii) achieving closure (iii) skill of silence and non-verbal cues and (iv) skill of recognizing attending behaviour and found instructional material synchronized with microteaching approach as effective.

Jangira et al. (1981) studied the effect of training in teaching skills through microteaching on skill competency and general teaching competency of inservice science teachers and pupil perceptions of teaching. It is observed that the means of teacher scores on the competence to use the skills of probing questioning, reinforcement, stimulus variation, illustrating with example, and increasing pupil participation as well as gain in teachers scores on general teaching competency before and after training in teaching skill using microteaching differ significantly at 0.01 lavel.

A large number of studies have been conducted with parallel group design with the Indian Microteaching Model to validate the development of skill competence measured by general teaching competency. The studies predominantly show significant difference between microteaching and traditional practice teaching favouring the Indian Microteaching Model (Joshi 1976 ;Passi 1976, Lalitha 1976, Singh 1973 ; et al. 1979(a) don et al.1979(b) Malbhtra 1979, Jangira 1981).

3 RESEARCH METHODOLOGY:

The New Product Development (NPD) research methodology will be adopted by the researcher for the development and validation of Instructional Interactive Competencies (IIC) package for Secondary School Teaching. Hence for the present study investigator is decided to follow experimental method of research. This package development and validation process will be as follows;


FIRST PHASE - DEVELOPMENT OF IIC PACKAGE
SECOND PHASE - INTERNAL VALIDATION OF IIC PACKAGE
THIRD PHASE - EXTERNAL VALIDATION OF IIC PACKAGE
(EXPERIMENTAL VALIDATION)

PHASE -1: DEVELOPMENT OF IIC PACAKAGE

In this phase, the researcher planned to develop the IIC package. Here, she planned to design the instructional package. The structure of the desired package is as follows;

1) Conceptual clarity and significance
2) Components and characters
3) Process, contexts and content suitability
4) Student teacher orientation presentation note
5) Student teacher orientation presentation video demos
6) Observation Schedule

7) Guidelines for teacher-educators for plan and post teach-session

PHASE -2: INTERNAL VALIDATION OF IIC PACAKAGE

During this second phase, the researcher planned for the internal validation of IIC package. This will be done against educational experts, teacher educators , in-service teachers' and student-teachers.

PHASE -3: EXTERNAL VALIDATION OF IIC PACAKAGE

In this Phase, the researcher planned for External validation of IIC package. External validity will be conducted with experimental tryout as follows;

Selection of the Tools:

Following tools will be used in the study;

1. Baroda General Teaching Competency Scale (BGTCS)
2. 5E Competency Scales (Developed by Investigator)
3. Content achievement Test (Developed by Investigator)
4. R.P.M (I.Q Test)
5. Language ability test (Developed by Investigator)
6. General Information Profile (Developed by Investigator)

Experimental Design:

Pre-test and post-test, parallel group design

Experimental Group	***Control Group***
Pre-test	Pre-test
Treatment (Development of IIC Package)	No Treatment (Conventional Method)
Post-test	Post-test

For experimentation, parallel group design will be used for the smooth conduct of experiment a teacher education institution with student-teacher as sample units.

Population for experiment:

In present study the **Student-Teacher** have been considered as a population of the present study. Karnataka state has a state level admission cell and student from various districts are selected and admitted in colleges. A college that has representation of major variables that influence the dependent variable will be selected. The population specifically represent Karnataka State and in general India at large.

Sample:

Among the interested list of teacher educators, two teacher educators with 100 student-teachers will be the sample for the present study.

Table - Details of sample for experimentation:

Sl No	Name of the Teacher-education institution	No. of Student-teachers selected	No. of teacher-educators selected
1	Department of Education, Karnataka State Akkamahadevi Women's University, Vijayapura,	Equated two groups each with 50 student teachers will be the sample	2

After experimental tryout, the researcher will plan to administrate two tools prepared namely Teacher-educator reaction scale and Student-teacher reaction scale for the effectiveness of package developed.

4 PROCEDURE FOR DATA ANALYSIS:

The data obtained on various tools will be treated quantitatively. Basically computation of mean testing and testing the hypothesis will be the t-test; ANOVA will be used for various variables. Percentage analysis and graphical representation will use with all other types data.

5 EXPECTED OUTCOMES:

The study will provide a well tried out IIC package to be used for 5E lesson presentation, new training technique for constructivism. Study will also helpful to alternate and follow up training technique for microteaching in light of constructivism.

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